

We Claim:

1. A method of joining heavy duty tubulars, the method comprising the step of:

5 joining the tubulars by forge welding and flushing a reducing flushing gas around the heated tubular ends during at least part of the forge welding operation such that oxides are removed from the forge welded tubular ends and the amount of oxide inclusions and irregularities between the forge welded tubular ends is limited, wherein the tubular ends have a non-planar  
10 shape.

2. The method of claim 1, wherein the tubular ends have an intermeshing regular sinusoidal or teethed shape around the circumference of the tubulars.

3. The method of claim 1, wherein the flushing gas is  
15 a non-explosive mixture of a substantially inert gas and a reducing gas, such as a mixture comprising more than 90% by volume of a substantially inert gas, such as nitrogen, helium or argon and more than 2% by volume of hydrogen.

20 4. The method of claim 1, wherein the heavy duty tubular string is a casing while drilling string which carries a drill bit while drilling the hole and which remains in the borehole in an expanded or unexpanded configuration after completion of the drilling process.

25 5. The method of claim 1, wherein the tubular ends are heated by passing a high frequency current in circumferential direction through the tubular walls near the tubular ends that are to be joined and wherein the presence of cold spots along the circumference of the  
30 heated tubular ends is reduced by arranging a series of longitudinal ferrite bars around the outer surface of the tubular ends and/or within the interior thereof.

6. The method of claim 2, wherein the tubular ends are heated by passing high frequency electrical current through the tubular ends by means of a series of electrodes which are pressed against the inner and/of outer surface of the tubular ends adjacent to the tips of the teeth and/or sinusoidal end faces.

7. The method of claim 1, wherein the tubulars are joined downhole by forge welding after a tube expansion operation and the tubular ends are heated to a forge welding temperature and pressed together whilst a reducing flushing gas is flushed around the heated tubular ends during at least part of the forge welding operation.

8. The method of claim 7, wherein the ends of the tubulars at least partly overlap each other and a forge welding device is inserted into the inner tubular which heats up the tubular ends, flushes a reducing flushing gas into any gap remaining between the overlapping tubular ends and which subsequently presses the outer surface of the heated end of the inner tubular against the inner surface of the outer tubular to join said tubular ends by forge welding, and wherein the end surfaces of the partially overlapping tubular ends are teathed or have a complementary sinusoidal shape in order to alleviate forces to the forge welded expanded tubular ends.